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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,607	07/31/2001	Jeremy Minshull	02-106410US	3959

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MAXYGEN, INC.
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EXAMINER	
TRAN, MY CHAU T	

ART UNIT	PAPER NUMBER
1639	

DATE MAILED: 07/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/920,607	MINSHULL ET AL.	
	Examiner	Art Unit	
	MY-CHAU T. TRAN	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-135,137 and 140-160* is/are pending in the application.

4a) Of the above claim(s) *1-68,73-130,132,133 and 137* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *69-72,131,134,135 and 140-160* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/09/2005 has been entered.

Application and Claims Status

2. Applicant's amendment filed 04/10/2006 is acknowledged and entered. Claims 131, 137, and 149 have been amended. Claims 136 and 138-139 have been cancelled.

3. Applicant's amendment and response filed 12/09/2005 are acknowledged and entered. Claims 69, 131, and 142 have been amended. Claims 145-160 have been added.

4. The amendment filed on 10/01/2004: amended claims 69 and 71, and added claims 131-144.

5. Claims 1-135, 137, and 140-160 are pending.

Election/Restrictions

6. Claims 1-68 and 73-130 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to ***nonelected inventions***, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/22/2002 and 07/30/2003.

7. The instant species election requirement is still in effect as there is no allowable generic or linking claim. Applicant has elected the following species for the elected invention (Claims 69-72 and 131-160) in the reply filed on 04/07/2005:

a. For the single specific species of enzyme, applicant elected enzymes having specificity for metabolite, i.e. claim 131.

8. Claims 132, 133, and 137 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to ***a nonelected species***, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 04/07/2005.

9. Claims 69-72, 131, 134, 135, and 140-160 are under consideration in this Office Action.

Priority

10. This instant application claims benefit to two provisional applications, which are 60/222,056 filed 07/31/2000, and 60/244,764 filed 10/31/2000. This instant application is granted the benefit of priority for both provisional applications, i.e. 60/222,056 and 60/244,764, under 35 U.S.C. 119(e).

Specification

11. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. For example, pages 74, 83, and 99 have embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

12. Claims 69-72, 131, 134, 135, and 140-160 are under consideration in this Office Action.

Claim Rejections - 35 USC § 112

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. Claims 69-72, 131, 134, 135, and 140-160 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) The phrase "*reaction product from reactions catalyzed*" in structural feature (d) of claim 69 is vague and indefinite because it is unclear as to the 'lower' limit of the instant claimed '*reaction catalyzed*' (i.e. catalytic reaction) from which the instant claimed '*reaction product*' is produced. The first recitation of the catalytic reaction recites the limitation of "*a reaction product from a reaction catalyzed*" (i.e. a lower limit of one)(see structural feature (c) of claim 69) whereas the phrase "*reaction product from reactions catalyzed*" imply that the 'lower' limit of the instant claimed '*reaction catalyzed*' is two, i.e. two catalytic reactions is needed to produced a product. Thus, it is unclear if the 'lower' limit of the instant claimed '*reaction*

catalyzed' refers to one catalytic '*reaction*' or two catalytic '*reactions*'. Therefore, the claim 69 and all its dependent claims are rejected under 35 U.S.C. 112, second paragraph.

b) The phrase "*reaction product from reactions catalyzed*" in structural feature (d) of claim 145 is vague and indefinite because it is unclear as to the 'lower' limit of the instant claimed '*reaction catalyzed*' (i.e. catalytic reaction) from which the instant claimed '*reaction product*' is produced. The first recitation of the catalytic reaction recites the limitation of "*a reaction product from a reaction catalyzed*" (i.e. a lower limit of one)(see structural feature (c) of claim 145) whereas the phrase "*reaction product from reactions catalyzed*" imply that the 'lower' limit of the instant claimed '*reaction catalyzed*' is two, i.e. two catalytic reactions is needed to produced a product. Thus, it is unclear if the 'lower' limit of the instant claimed '*reaction catalyzed*' refers to one catalytic '*reaction*' or two catalytic '*reactions*'. Therefore, the claim 145 and all its dependent claims are rejected under 35 U.S.C. 112, second paragraph.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

16. Claims 69-72, 131, 134, and 140 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Barrett et al. (US Patent 5,482,867).

The instant invention recites a device, i.e. a biosensor for detecting different small molecules in a sample. The structural features of the device comprise (a) a solid support; (b) a plurality of enzymes immobilized on the solid support; (c) a detection system; and (d) a data storage system.

The plurality of enzymes comprises an artificial enzyme variant of a naturally occurring enzyme. The enzymes comprise different small molecule substrate specificities and exhibits enhanced stability relative to the natural enzyme. These limitations are interpreted as the functionality/property of the instant claimed enzyme/ artificial enzyme variant.

The detection system is capable of detecting a reaction product from a reaction catalyzed by each of the enzymes in the plurality of enzymes, either directly or indirectly. This is interpreted as a functionality of the instant claimed detection system.

The limitation of "in which data corresponding to detected reaction product from reactions catalyzed by each of the enzymes in the plurality of enzymes is recorded" is interpreted as a functionality of the instant claimed data storage system.

Barrett et al. disclose a device and methods of making the device (see e.g. Abstract; col. 2, lines 36-39). The device comprises a solid support (refers to instant claimed solid support) and a plurality of anti-ligands immobilized on predefined regions on the surface of the solid support (refers to instant claimed plurality of enzymes, and claims 71 and 134) wherein the plurality of regions on the surface of the solid support contain the same or different anti-ligands (see e.g. col. 2, lines 36-39; col. 5, lines 4-20; col. 6, lines 52-59). The surface of the solid support is composed of material such as polymer, e.g. aryl acetylenes, on which the plurality of anti-ligands is immobilized (refers to instant claimed non-biological polymeric matrix, and claims 71 and 140)(see e.g. col. 4, lines 3-7; col. 7, line 66 thru col. 8, line 21). The anti-ligands include naturally-occurring or manmade molecules such as enzymes (refers to instant claimed artificial enzyme variant and claim 131)(see e.g. col. 4, lines 34-60; col. 19, line 60 thru col. 20, line 20). The device also comprises a detection system such as a scanning fluorescence

microscope that include and IBM compatible PC for use in screening methods (refers to instant claimed detection system and data storage system, and instant claim 72) and further comprises fluorescent maker for use in screening methods (refers to instant claimed '*optically detectable element*' of claim 70)(see e.g. col. 21, lines 7-54; col. 29, lines 19-29; col. 31, line 15 thru col. 32, line 12; fig. 10).

Alternatively, the claimed invention further differs from the prior art teachings only by the recitation of the properties of the instant claimed '*enzyme/ artificial enzyme variant*' (i.e. '*having different small molecule substrate specificities*', '*exhibits enhanced stability relative to the natural enzyme*', and '*has specificity for a metabolite*'). The claimed invention appears to be the same or obvious variations of the reference teachings, absent a showing of unobvious differences. The office does not have the facilities and resources to provide the factual evidence needed in order to determine and/or compare the specific activities of the instant versus the reference '*enzyme/ artificial enzyme variant*'. In the absence of evidence to the contrary, the burden is upon the applicant to prove that the claimed '*enzyme/ artificial enzyme variant*' is different from the one taught by prior art and to establish the patentable differences. See *In re Best* 562F.2d 1252, 195 USPQ 430 (CCPA 1977) and *Ex parte Gray* 10 USPQ2d 1922 (PTO Bd. Pat. App. & Int. 1989).

Furthermore, functionalities of the instant claimed '*detection system*' and '*data storage system*' are not giving any patentable weight since these functionalities does not impart any structural limitation to the instant claimed apparatus, i.e. the '*detection system*' and '*data storage system*'. See MPEP § 2115, which states:

> MATERIAL OR ARTICLE WORKED UPON DOES NOT LIMIT APPARATUS CLAIMS
> "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164

> USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 75 F.2d *>996<, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

Therefore, the device of Barrett et al. anticipates the presently claimed device.

17. Claims 145-150 and 152 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Barrett et al. (US Patent 5,482,867).

> *The instant invention recites a device, i.e. a biosensor for detecting different small molecules in a sample. The structural features of the device comprise (a) a solid support; (b) a plurality of enzymes immobilized on the solid support; (c) a detection system; and (d) a data storage system.*
> *The plurality of enzymes comprises an artificial enzyme variant of a naturally occurring enzyme. The enzymes comprise different small molecule substrate specificities and a non-naturally occurring catalytic specificity. These limitations are interpreted as the functionality/property of the instant claimed enzyme/ artificial enzyme variant.*
> *The detection system is capable of detecting a reaction product from a reaction catalyzed by each of the enzymes in the plurality of enzymes, either directly or indirectly. This is interpreted as a functionality of the instant claimed detection system.*
> *The limitation of "in which data corresponding to detected reaction product from reactions catalyzed by each of the enzymes in the plurality of enzymes is recorded" is interpreted as a functionality of the instant claimed data storage system.*

Barrett et al. disclose a device and methods of making the device (see e.g. Abstract; col. 2, lines 36-39). The device comprises a solid support (refers to instant claimed solid support) and a plurality of anti-ligands immobilized on predefined regions on the surface of the solid support (refers to instant claimed plurality of enzymes, and claims 147 and 150) wherein the plurality of regions on the surface of the solid support contain the same or different anti-ligands (see e.g. col. 2, lines 36-39; col. 5, lines 4-20; col. 6, lines 52-59). The surface of the solid support is composed of material such as polymer, e.g. aryl acetylenes, on which the plurality of

anti-ligands is immobilized (refers to instant claimed non-biological polymeric matrix, and claims 147 and 152)(see e.g. col. 4, lines 3-7; col. 7, line 66 thru col. 8, line 21). The anti-ligands include naturally-occurring or manmade molecules such as enzymes (refers to instant claimed artificial enzyme variant and claim 149)(see e.g. col. 4, lines 34-60; col. 19, line 60 thru col. 20, line 20). The device also comprises a detection system such as a scanning fluorescence microscope that include and IBM compatible PC for use in screening methods (refers to instant claimed detection system and data storage system, and instant claims 148 and 149) and further comprises fluorescent maker for use in screening methods (refers to instant claimed '*optically detectable element*' of claim 146)(see e.g. col. 21, lines 7-54; col. 29, lines 19-29; col. 31, line 15 thru col. 32, line 12; fig. 10).

Alternatively, the claimed invention further differs from the prior art teachings only by the recitation of the properties of the instant claimed '*enzyme/ artificial enzyme variant*' (i.e. '*having different small molecule substrate specificities*', and '*a non-naturally occurring catalytic specificity*', and '*has specificity for a metabolite*'). The claimed invention appears to be the same or obvious variations of the reference teachings, absent a showing of unobvious differences. The office does not have the facilities and resources to provide the factual evidence needed in order to determine and/or compare the specific activities of the instant versus the reference '*enzyme/ artificial enzyme variant*'. In the absence of evidence to the contrary, the burden is upon the applicant to prove that the claimed '*enzyme/ artificial enzyme variant*' is different from the one taught by prior art and to establish the patentable differences. See *In re Best* 562F.2d 1252, 195 USPQ 430 (CCPA 1977) and *Ex parte Gray* 10 USPQ2d 1922 (PTO Bd. Pat. App. & Int. 1989).

Furthermore, functionalities of the instant claimed '*detection system*' and '*data storage system*' are not giving any patentable weight since these functionalities does not impart any structural limitation to the instant claimed apparatus, i.e. the '*detection system*' and '*data storage system*'. See MPEP § 2115, which states:

> MATERIAL OR ARTICLE WORKED UPON DOES NOT LIMIT APPARATUS CLAIMS "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 75 F.2d *>996<, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

Therefore, the device of Barrett et al. anticipates the presently claimed device.

18. Claims 69-72, 131, 134, 135, 140-144, 157, and 158 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Keen (US Patent 6,060,327; *effective filing date of 5/14/1997*).

> *The instant invention recites a device, i.e. a biosensor for detecting different small molecules in a sample. The structural features of the device comprise (a) a solid support; (b) a plurality of enzymes immobilized on the solid support; (c) a detection system; and (d) a data storage system.*
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> *The plurality of enzymes comprises an artificial enzyme variant of a naturally occurring enzyme. The enzymes comprise different small molecule substrate specificities and exhibits enhanced stability relative to the natural enzyme. These limitations are interpreted as the functionality/property of the instant claimed enzyme/ artificial enzyme variant.*
>
> *The detection system is capable of detecting a reaction product from a reaction catalyzed by each of the enzymes in the plurality of enzymes, either directly or indirectly. This is interpreted as a functionality of the instant claimed detection system.*
>
> *The limitation of "in which data corresponding to detected reaction product from reactions catalyzed by each of the enzymes in the plurality of enzymes is recorded" is interpreted as a functionality of the instant claimed data storage system.*

Keen discloses a sensor device (see e.g. Abstract; col. 7, line 44 thru col. 8, line 28; col. 9, lines 3-24; col. 11, lines 45-60). The device comprises a plurality of conductive polymer strands (refers to instant claimed non-biological polymeric matrix of claim 71), a plurality of recognition headgroups having an affinity for the analyte component and attached to the first ends of the conductive polymer strands (refers to instant claimed "*a plurality of enzymes immobilized on the solid support*", and claims 71, 131, 134 and 140), and an electrode substrate attached to the conductive polymer strands at the second ends (refers to instant claimed solid support, and claims 70 and 142)(see e.g. col. 7, line 44 thru col. 8, line 28; col. 9, lines 3-24; col. 12, line 38 thru col. 13, line 53; figs. 2 and 3). The device is also divided into a plurality of regions wherein each comprises a different headgroups that detect different analytes such that each of these regions will be separately addressable by electronic circuitry to uniquely identify the presence of the particular analyte component (refers to instant claims 134 and 135)(see e.g. col. 10, lines 13-28; col. 14, line 57 thru col. 15, line 22). The types of polymer strands include polymers such as ferrocene polymers (refers to instant claimed non-biological polymeric matrix, and claim 140)(see e.g. col. 25, lines 3-65), and wherein the ferrocene of the ferrocene polymers is a mediator as evidence by Hale et al. (see e.g. pg. 3483, fig. 2)(refers to instant claims 143, 144, 157, and 158). The types of headgroups include enzymes such as lipases and oxidoreductases and enzymes can be obtained from combinatorial libraries (refers to instant artificial enzyme variant and claim 131)(see e.g. col. 26, lines 5-36; col. 31, lines 16-40). The device is connected to a digital multimeter that measures the circuit output (refers to instant claimed detection system, and claims 70 and 141) (see e.g. col. 39, lines 7-45; figs 5 and 6) or connected to instruments such as a pen-based digital meter or lab-based instruments (refers to

instant claimed detection system/data storage system, and claim 72) (see e.g. col. 37, line 66 thru col. 38, line 63; col. 39, line 46 thru col. 40, line 3).

Alternatively, the claimed invention further differs from the prior art teachings only by the recitation of the properties of the instant claimed '*enzyme/ artificial enzyme variant*' (i.e. '*having different small molecule substrate specificities*', '*exhibits enhanced stability relative to the natural enzyme*', and '*has specificity for a metabolite*'). The claimed invention appears to be the same or obvious variations of the reference teachings, absent a showing of unobvious differences. The office does not have the facilities and resources to provide the factual evidence needed in order to determine and/or compare the specific activities of the instant versus the reference '*enzyme/ artificial enzyme variant*'. In the absence of evidence to the contrary, the burden is upon the applicant to prove that the claimed '*enzyme/ artificial enzyme variant*' is different from the one taught by prior art and to establish the patentable differences. See *In re Best* 562F.2d 1252, 195 USPQ 430 (CCPA 1977) and *Ex parte Gray* 10 USPQ2d 1922 (PTO Bd. Pat. App. & Int. 1989).

Furthermore, functionalities of the instant claimed '*detection system*' and '*data storage system*' are not giving any patentable weight since these functionalities does not impart any structural limitation to the instant claimed apparatus, i.e. the '*detection system*' and '*data storage system*'. See MPEP § 2115, which states:

> MATERIAL OR ARTICLE WORKED UPON DOES NOT LIMIT APPARATUS CLAIMS
> "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 75 F.2d *>996<, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

Therefore, the device of Keen anticipates the presently claimed device.

19. Claims 145-156, 159, and 160 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Keen (US Patent 6,060,327; *effective filing date of 5/14/1997*).

> *The instant invention recites a device, i.e. a biosensor for detecting different small molecules in a sample. The structural features of the device comprise (a) a solid support; (b) a plurality of enzymes immobilized on the solid support; (c) a detection system; and (d) a data storage system.*
> *The plurality of enzymes comprises an artificial enzyme variant of a naturally occurring enzyme. The enzymes comprise different small molecule substrate specificities and a non-naturally occurring catalytic specificity. These limitations are interpreted as the functionality/property of the instant claimed enzyme/ artificial enzyme variant.*
> *The detection system is capable of detecting a reaction product from a reaction catalyzed by each of the enzymes in the plurality of enzymes, either directly or indirectly. This is interpreted as a functionality of the instant claimed detection system.*
> *The limitation of "in which data corresponding to detected reaction product from reactions catalyzed by each of the enzymes in the plurality of enzymes is recorded" is interpreted as a functionality of the instant claimed data storage system.*

Keen discloses a sensor device (see e.g. Abstract; col. 7, line 44 thru col. 8, line 28; col. 9, lines 3-24; col. 11, lines 45-60). The device comprises a plurality of conductive polymer strands (refers to instant claimed non-biological polymeric matrix of claim 177), a plurality of recognition headgroups having an affinity for the analyte component and attached to the first ends of the conductive polymer strands (refers to instant claimed "*a plurality of enzymes immobilized on the solid support*", and claims 147, 149, 150 and 152), and an electrode substrate attached to the conductive polymer strands at the second ends (refers to instant claimed solid support, and claims 146 and 154)(see e.g. col. 7, line 44 thru col. 8, line 28; col. 9, lines 3-24; col. 12, line 38 thru col. 13, line 53; figs. 2 and 3). The device is also divided into a plurality of regions wherein each comprises a different headgroups that detect different analytes such that

each of these regions will be separately addressable by electronic circuitry to uniquely identify the presence of the particular analyte component (refers to instant claims 150 and 151)(see e.g. col. 10, lines 13-28; col. 14, line 57 thru col. 15, line 22). The types of polymer strands include polymers such as ferrocene polymers (refers to instant claimed non-biological polymeric matrix, and claim 151)(see e.g. col. 25, lines 3-65), and wherein the ferrocene of the ferrocene polymers is a mediator as evidence by Hale et al. (see e.g. pg. 3483, fig. 2)(refers to instant claims 155, 156, 159, and 160). The types of headgroups include enzymes such as lipases and oxidoreductases and enzymes can be obtained from combinatorial libraries (refers to instant artificial enzyme variant and claim 149)(see e.g. col. 26, lines 5-36; col. 31, lines 16-40). The device is connected to a digital multimeter that measures the circuit output (refers to instant claimed detection system, and claims 146 and 153) (see e.g. col. 39, lines 7-45; figs 5 and 6) or connected to instruments such as a pen-based digital meter or lab-based instruments (refers to instant claimed detection system/data storage system, and claim 148) (see e.g. col. 37, line 66 thru col. 38, line 63; col. 39, line 46 thru col. 40, line 3).

Alternatively, the claimed invention further differs from the prior art teachings only by the recitation of the properties of the instant claimed '*enzyme/ artificial enzyme variant*' (i.e. '*having different small molecule substrate specificities*', and '*a non-naturally occurring catalytic specificity*', and '*has specificity for a metabolite*'). The claimed invention appears to be the same or obvious variations of the reference teachings, absent a showing of unobvious differences. The office does not have the facilities and resources to provide the factual evidence needed in order to determine and/or compare the specific activities of the instant versus the reference '*enzyme/ artificial enzyme variant*'. In the absence of evidence to the contrary, the burden is upon the

applicant to prove that the claimed '*enzyme/ artificial enzyme variant*' is different from the one taught by prior art and to establish the patentable differences. See *In re Best* 562F.2d 1252, 195 USPQ 430 (CCPA 1977) and *Ex parte Gray* 10 USPQ2d 1922 (PTO Bd. Pat. App. & Int. 1989).

Furthermore, functionalities of the instant claimed '*detection system*' and '*data storage system*' are not giving any patentable weight since these functionalities does not impart any structural limitation to the instant claimed apparatus, i.e. the '*detection system*' and '*data storage system*'. See MPEP § 2115, which states:

> MATERIAL OR ARTICLE WORKED UPON DOES NOT LIMIT APPARATUS CLAIMS "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 75 F.2d *>996<, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

Therefore, the device of Keen anticipates the presently claimed device.

Status of Claims Rejections

20. The rejection of claims 69-72, 131, and 140-144 under 35 USC 102(b) as being anticipated by Hale et al. (*JACS*, **1989**, 111(9), pgs. 3482-3484) has been withdrawn in light of applicant's amendments of claim 69 and cancellation of claims 136 and 138-139.

21. The rejection of claims 69-72, 131, and 1 40-143 under 35 USC 102(b) as being anticipated by Hu et al. (*Analytical Sciences*, **June 1999**, 15(6), pgs. 585-588) has been withdrawn in light of applicant's amendments of claim 69 and cancellation of claims 136 and 138-139.

Response to Arguments

22. Applicant's arguments directed to the rejection under 35 USC 102(b) as being anticipated by Barrett et al. (US Patent 5,482,867) for claims 69-72, 131, 134, and 140 were considered but they are not persuasive for the following reasons. Please note that this rejection has been modified from it original version to more clearly address applicant's newly amended and/or added claims and/or arguments.

[1] Applicant contends that Barrett et al. does not describe a plurality of enzymes comprising enzymes having different small molecule substrate specificities.

[2] Applicant alleges that Barrett et al. does not describe a plurality of enzymes comprising artificial enzymes variant.

Therefore, the device of Barrett et al. does not anticipate the presently claimed invention.

This is not found persuasive for the following reasons:

[1] The examiner respectfully disagrees. It is the examiner's position that the instant claimed functionality/property of the enzyme, i.e. having different small molecule substrate specificities, do not distinguish it from the enzymes of Barrett et al. because Barrett et al. do disclose the structural limitation of the claimed device, i.e. a plurality of enzymes immobilized on a solid support (see col. 5, lines 4-20; col. 4, lines 34-60). Moreover, the claimed enzymes appear to be the same or obvious variations of the reference teachings, absent a showing of unobvious differences. The office does not have the facilities and resources to provide the factual evidence needed in order to determine and/or compare the specific activities of the instant versus the reference '*enzyme/ artificial enzyme variant*'. In the absence of evidence to the contrary, the burden is upon the applicant to prove that the claimed '*enzyme/ artificial enzyme*

variant' is different from the one taught by prior art and to establish the patentable differences. See *In re Best* 562F.2d 1252, 195 USPQ 430 (CCPA 1977) and *Ex parte Gray* 10 USPQ2d 1922 (PTO Bd. Pat. App. & Int. 1989).

[2] The examiner respectfully disagrees. It is the examiner's position that Barrett et al. do disclose a plurality of anti-ligands immobilized on predefined regions on the surface of the solid support wherein the anti-ligands include naturally-occurring or manmade molecules such as enzymes, i.e. a plurality of enzymes comprising artificial enzymes variant (see col. 5, lines 4-20; col. 4, lines 34-60). Accordingly, Barrett et al. do disclose a plurality of enzymes comprising artificial enzymes variant.

Consequently, the device of Barrett et al. does anticipate the presently claimed invention, and the rejection is maintained.

23. Applicant's arguments directed to the rejection under 35 USC 102(e) as being anticipated by Keen (US Patent 6,060,327) for claims 69-72, 131, 134, 135, and 140-142 were considered but they are not persuasive for the following reasons. Please note that this rejection has been modified from it original version to more clearly address applicant's newly amended and/or added claims and/or arguments.

[1] Applicant contends that Keen does not describe a plurality of enzymes comprising artificial enzymes variant.

[2] Applicant alleges that Keen does not describe that the artificial enzymes variant can either '*exhibits enhanced stability relative to the natural enzyme*' or '*a non-naturally occurring catalytic specificity*'.

Therefore, the device of Keen does not anticipates the presently claimed invention.

This is not found persuasive for the following reasons:

[1] The examiner respectfully disagrees. It is the examiner's position that Keen does describe a plurality of enzymes comprising artificial enzymes variant. Keen disclose obtaining enzymes from combinatorial libraries, i.e. artificial enzymes variant (see col. 26, lines 5-36). Accordingly, Keen does describe a plurality of enzymes comprising artificial enzymes variant.

[2] The examiner respectfully disagrees. It is the examiner's position that the instant claimed functionality/property of the artificial enzymes variant, i.e. '*exhibits enhanced stability relative to the natural enzyme*' or '*a non-naturally occurring catalytic specificity*', do not distinguish it from the enzymes of Keen because Keen do disclose the structural limitation of the claimed device, i.e. a plurality of enzymes immobilized on a solid support (see col. 10, lines 13-28). Moreover, the claimed enzymes appear to be the same or obvious variations of the reference teachings, absent a showing of unobvious differences. The office does not have the facilities and resources to provide the factual evidence needed in order to determine and/or compare the specific activities of the instant versus the reference '*artificial enzyme variant*'. In the absence of evidence to the contrary, the burden is upon the applicant to prove that the claimed '*artificial enzyme variant*' is different from the one taught by prior art and to establish the patentable differences. See *In re Best* 562F.2d 1252, 195 USPQ 430 (CCPA 1977) and *Ex parte Gray* 10 USPQ2d 1922 (PTO Bd. Pat. App. & Int. 1989).

Consequently, the device of Keen does anticipate the presently claimed invention, and the rejection is maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to My-Chau T. Tran whose telephone number is 571-272-0810. The examiner can normally be reached on Monday: 8:00-2:30; Tuesday-Thursday: 7:30-5:00; Friday: 8:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Paras, Jr., can be reached on 571-272-4517. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

My-Chau T. Tran 
July 5, 2006